PM10 EXCEPTIONAL EVENT
MARCH 27, 2007
MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT

ADDENDUM TO DISTRICT NATURAL EVENT DOCUMENTATION

This report is an addendum to the Natural Event Documentation (NED) for the Victorville monitoring station prepared by the Mojave Desert Air Quality Management District (District). The District documentation was submitted to the California Air Resources Board (ARB) on June 28, 2007, and supplemented in September 28, 2007 and March 3, 2008. This report demonstrates that without this natural high wind event, there would not have been exceedances of the federal PM10 Standard on March 27, 2007.

The Code of Federal Regulations (CFR) provides the definition and criteria for determining whether air quality data is impacted by an exceptional event. The 40 CFR 50.1 (j) definition states that "exceptional event means an event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by the Administrator in accordance with 40 CFR 50.14 to be an exceptional event." The demonstration to justify data exclusion as outlined in 40 CFR 50.14 specifies that evidence must be provided that:

1. The event meets the definition of an exceptional event;
2. There is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected air quality in the area;
3. The event is associated with a measured concentration in excess of normal historical fluctuations, including background; and,
4. There would have been no exceedance or violation but for the event.

This report documents that the event meets the above criteria and provides analysis to demonstrate that:

I. The dust event was not reasonably controllable or preventable because the PM10 originated from a non-anthropogenic source;
II. There is a clear-causal connection between the high wind event and the exceedance at Victorville;
III. The measured concentration was beyond normal historical levels; and
IV. The exceedance would not have occurred "but for" the high winds.

Overview of Event

On March 27, 2007, strong wind gusts over the Mojave Desert Air Quality Management District entrained dust into the atmosphere, causing PM10 exceedances at the Victorville monitor. Anthropogenic sources near the monitor played only a small role in the PM10 levels seen at this site. The District has reasonable and appropriate controls in place to reduce dust from anthropogenic sources. The winds on this day, however,

were high enough to overwhelm any control measures. Therefore, this natural event and the associated exceedance was not reasonably controllable or preventable.

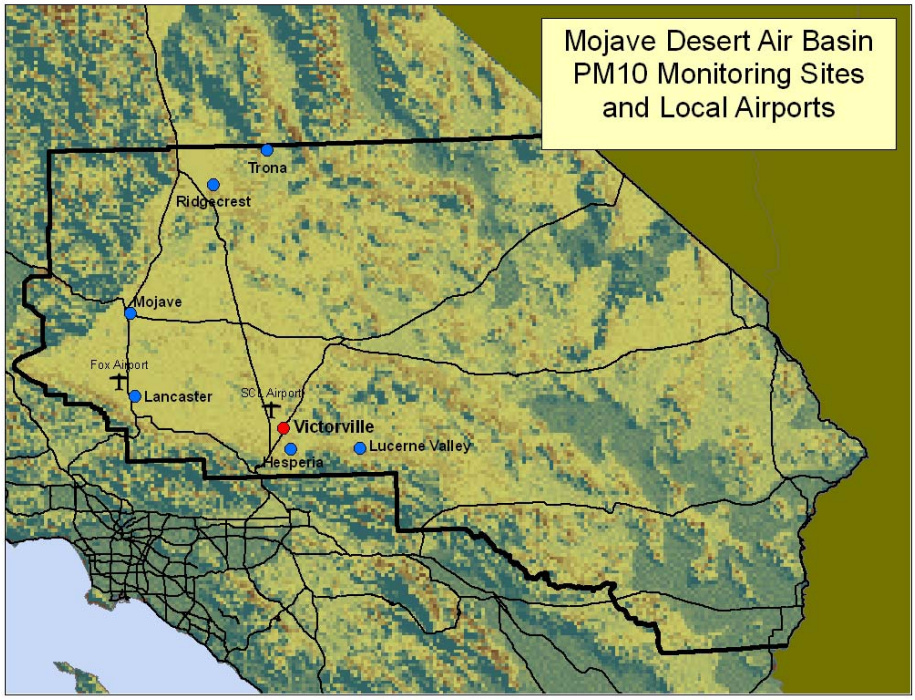
Affected Air Quality

On March 27, 2007, the Federal Equivalent Method (FEM) TEOM (Tapered Element Oscillating Microbalance) monitor at Victorville in the Mojave Desert Air Quality Management District (District) recorded a concentration of 238.7 $\mu g/m^3$, exceeding the National Ambient Air Quality Standard (NAAQS) of 150 $\mu g/m^3$. This was not a scheduled monitoring day for the Federal Reference Method (FRM) monitors. The only other TEOM operating in the District was Trona (80 miles to the north).

Table 1. Mojave Desert PM10 monitoring sites and Concentrations – 3/26/07-3/28/07

			PM10 Concentration (ug/m3)			
Site	**Monitor**	**AQS No.**	**3/25/07**	**3/26/07**	**3/27/07**	**3/28/07**
Victorville	FRM	60710306	24			
Victorville	TEOM	60710306	24.3	31.8	**238.7**	17.3
Trona	FRM	60711234	19			
Trona	TEOM	60711234	22.6	39.9	12.7	8.2
Ridgecrest	FRM	60290015	16			
Mojave-Poole	FRM	60290011	20			
Lucerne Valley	FRM	60710013	22			
Lancaster	FRM	60379033	19			
Hesperia	FRM	60714001	21			
Barstow	FRM	60710001	23		67	

Figure 1. Mojave Desert PM10 monitoring sites and airports

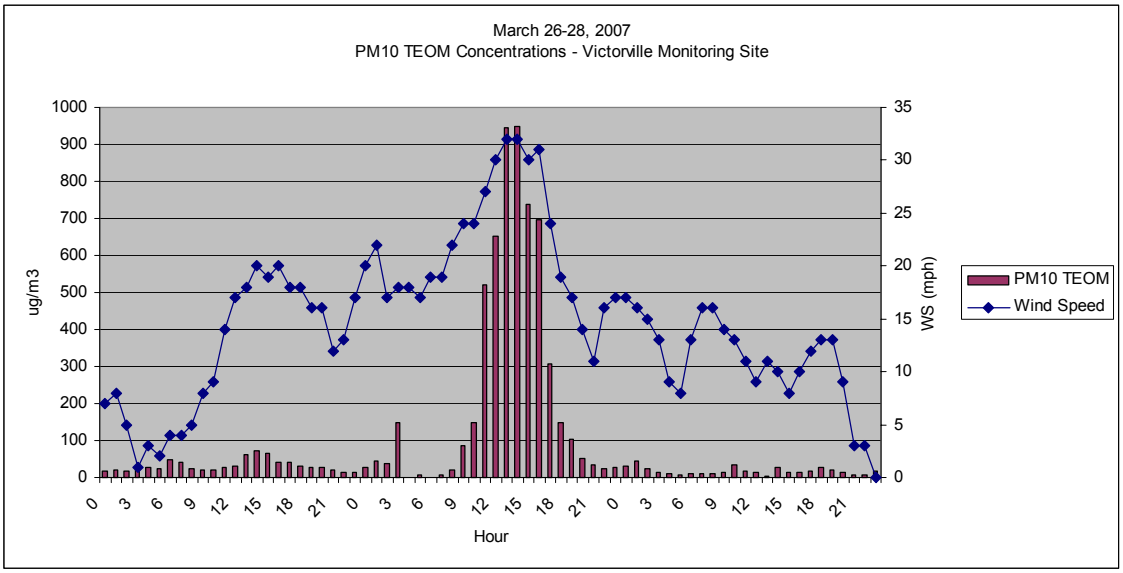


Clear Causal Connection

Hourly winds, which began to increase on March 26 at the Mojave Desert and Air Resources Board monitoring sites (Appendix A in the District NED gusted as high as 52 mph at the Victorville monitoring site on March 27. These winds were primarily from the desert areas to the west/northwest of the monitoring site. PM10 concentrations at the Victorville TEOM monitor showed commensurate increases, peaking at over 900 $\mu g/m^3$ on March 27. Both wind speeds and PM concentrations had decreased by the next day, March 28, returning to levels seen before the event.

PM10 concentrations (Figure 2) at the Victorville TEOM monitor show a slight increase on March 26, corresponding to the increase in surface wind speeds. The highest PM peaks, however, which resulted in the PM10 exceedance, occurred with the highest wind speeds on March 27. Both PM concentrations and wind speeds decreased rapidly in the latter part of the day, returning to normal, lower levels on March 28.

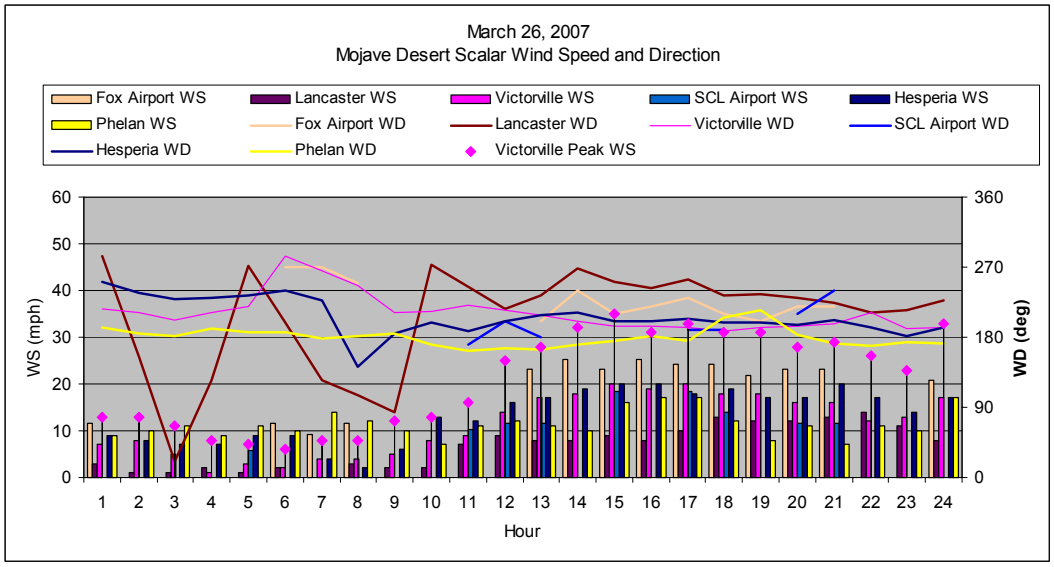
Figure 2. PM10 TEOM Concentrations and Wind Speeds at Victorville – March 26-28, 2007.



March 26

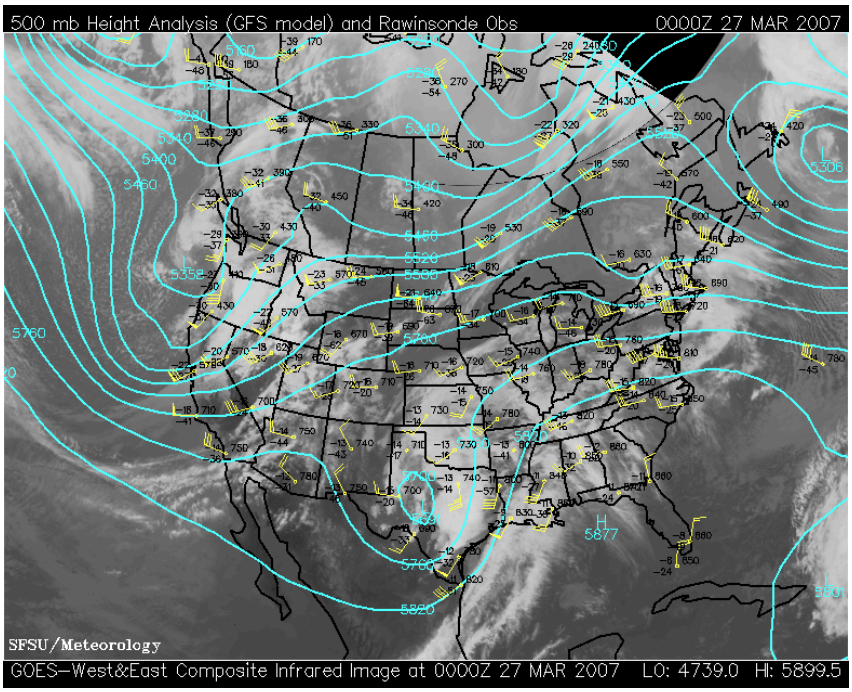
Hourly average data (Figure 3) from District monitoring sites shows wind speed throughout the region increased substantially in the late morning of March 26. Hourly averages reached as high as 25 mph at the Fox Airport, well above the regional dust entrainment thresholds of 15 mph in Imperial County (ENVIRON, 2004) to the south and 18 mph in the San Joaquin Valley (Bush, 2004; 73 FR 14696) to the north. Peak winds (gusts) at the Victorville site were above 20 mph each hour beginning at 11:00 a.m., reaching a peak of 35 mph.

Figure 3 – Hourly Average Wind Speeds and Directions at District Monitoring Sites



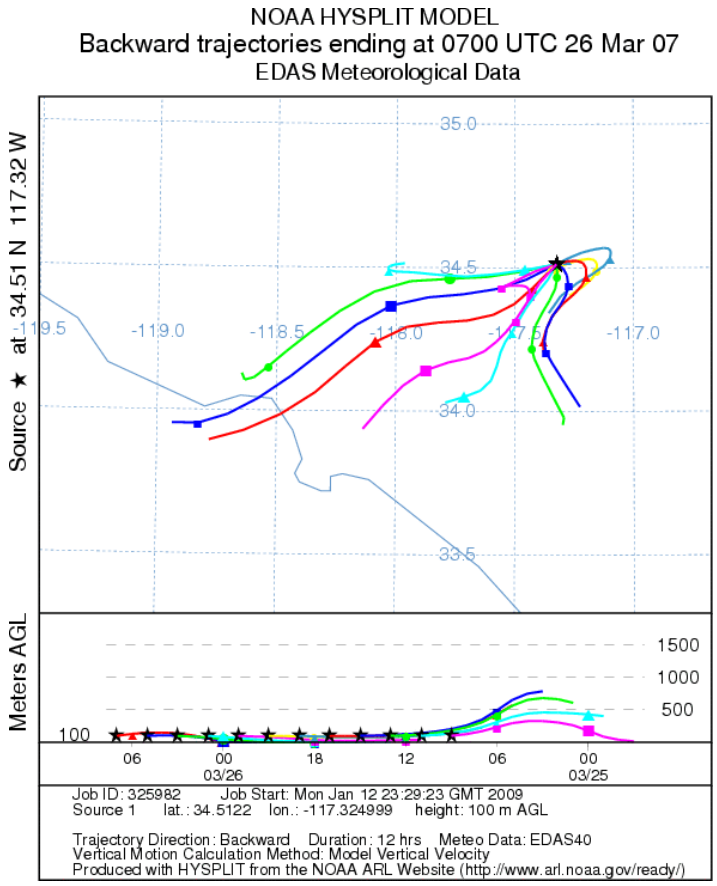
Satellite data on March 26 (Figure 4), shows strong airflow in the upper atmosphere from the west, supporting the surface pattern flow and allowing entrained dust to be transported to the Victorville air monitoring site in the Mojave Desert.

Figure 4: Upper Atmosphere Wind Flow
Satellite GOES West/East Composite IR - 500 mb level
00Z 032707 (5 p.m. PDT 032607)



Backward trajectories, using NOAA's HYSPLIT model, corroborate a western impact. Figure 5 shows impact at the Victorville site from noon to midnight on March 26. The trajectories in the latter part of the evening indicate a shift from southwest to west.

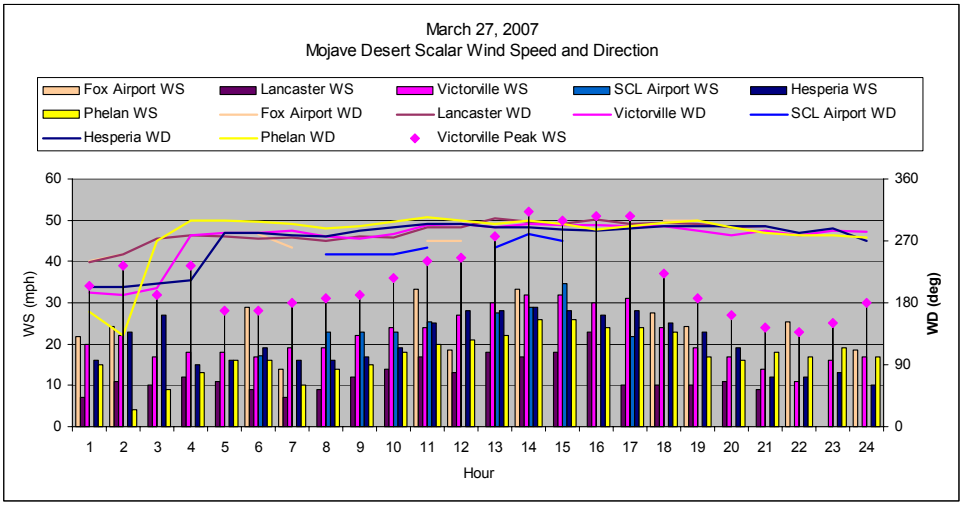
Figure 5. NOAA HYSPLIT backward trajectories – noon to midnight, 03/26/07.



March 27

The high winds of the 26th continued into the next day, with hourly averages of 30 mph or more from noon to 4 p.m., with gusts as high as 50 mph. PM concentrations, shown in Figure 2 above, reached over 900 ug/m3, corresponding with the highest wind speeds. These concentrations decreased to below NAAQS levels with the decrease in wind speed in the latter part of the day.

Figure 6 – Hourly Average Wind Speeds and Directions at District Monitoring Sites



The satellite image (Figure 7) of the morning of March 27, shows strong airflow in the upper atmosphere from the west, supporting the surface flow pattern. Later in the day (5 p.m.), the satellite view shows a more northern component to the upper air flow and the station monitors corroborate the lower wind speeds already noted at the monitoring site.

Figure 7: Upper Atmosphere Wind Flow
Satellite GOES West/East Composite IR - 500 mb level
12Z 032707 (5 a.m. PDT 032707)

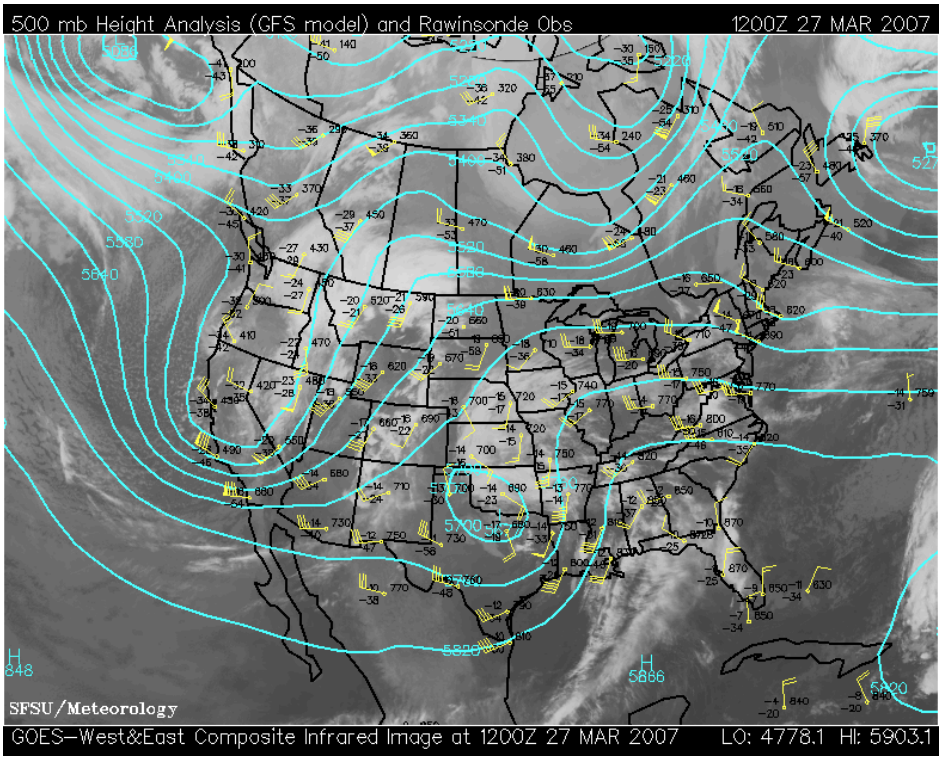
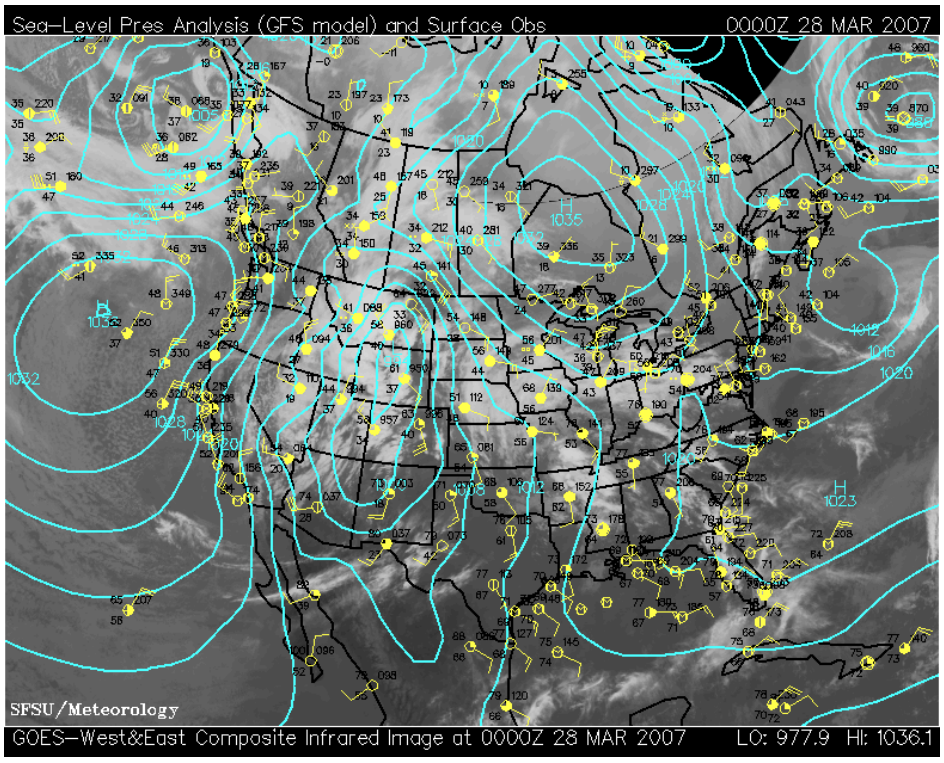
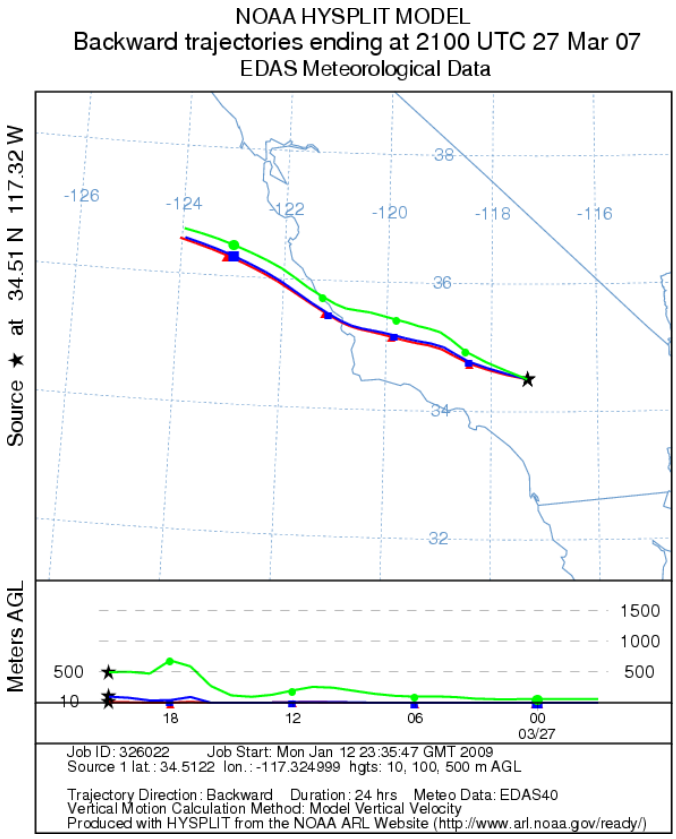


Figure 7: Upper Atmosphere Wind Flow (cont.)
00Z 032807 (5 p.m. PDT 032707)



Hysplit backward trajectory models indicate a western/northwestern impact at three levels in the atmosphere at Victorville at 2:00 p.m., the time of the peak PM10 concentrations,.

Figure 8. NOAA HYSPLIT backward trajectories for March 27, 2007 – 2:00 p.m.



Above Historical and Background Levels

Wind Speed

Historically, the predominant wind at Lucerne Valley, located 24 miles ESE of Victorville, is from the west-northwest at around 10 mph (around 60% of the time). In the spring, these winds increase to approximately 12 mph. The annual resultant winds are from the west/northwest at approximately 5 mph, with those in the spring coming from the same direction at less than 7 mph [CARB, 1984]. On March 27, winds were from the expected west/northwest direction, but hourly average speeds were considerably higher than seasonal predominant or resultant winds, ranging up to 32 mph, with gusts of up to 52 mph. These speeds were well above both background levels and historical fluctuations.

Maximum wind speeds at the Victorville monitoring site (Table 2) showed March mean daily maximum wind speeds of 15 mph (13 mph for 2007). A standard deviation of the combined data was 5.72. The number of days with high winds is shown in Table 3. The only other March day that exceeded the NAAQS since 2003 was March 26, 2004, a day with similar characteristics and which would have been considered an exceptional event under the current Rule. As shown in Figure 9, the maximum wind speed at Victorville on March 27, 2007 (not including wind gusts) was almost three standard deviations above the March historical average, making it clearly an exceptional event.

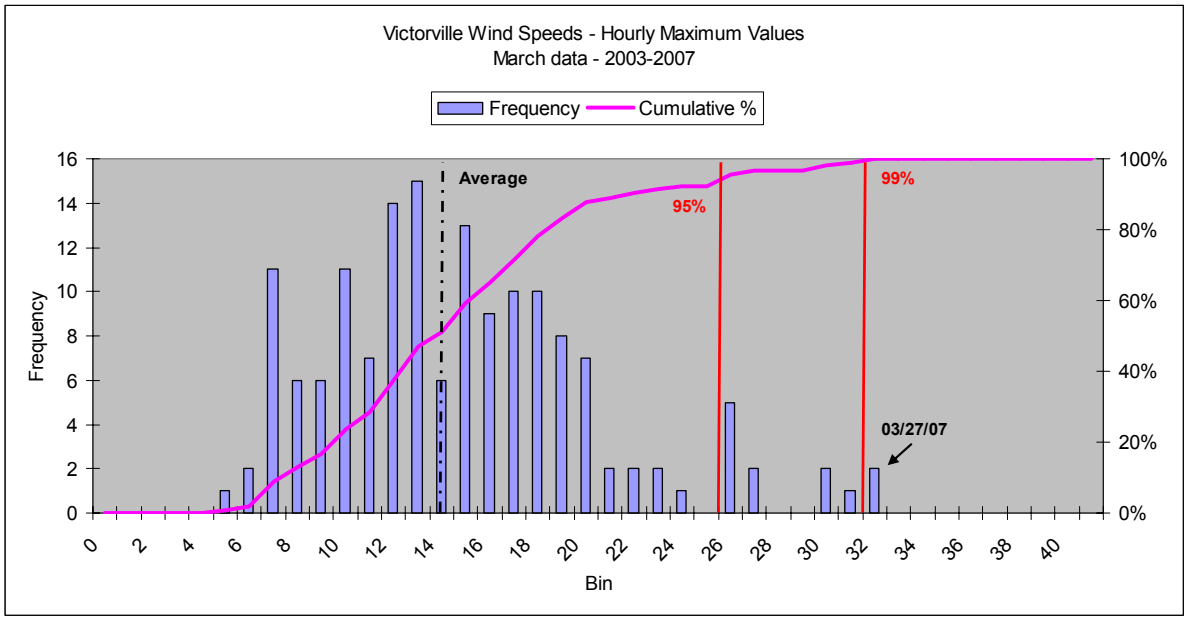
Table 2. March Daily Maximum Wind Speed Statistics for Victorville

	2003-2007	2003	2004	2005	2006	2007
Mean	14.87742	16.3871	13.03226	14.87097	16.70968	13.3871
Standard Error	0.45999	1.09807	0.782172	1.099112	1.019375	0.995341
Median	14	15	13	14	18	12
Mode	13	15	13	17	18	15
Standard Deviation	5.726829	6.113795	4.35495	6.119597	5.675641	5.541825

Table 3. March Maximum Wind Speeds and PM10 TEOM Concentrations (2003-2007).

Wind Speed (mph)	**No. of Days**	**PM10 range**
15-17	31	6.6 – 43.5
18-20	24	5.2 – 38.2
21-23	6	8.9 – 30.2
24-26	6	9.8 – 163*
27-29	2	18.8 – 18.8
30-32	5	32.5 – 239**
		*3/26/04 event similar to current event but not excluded. ** 3/27/07 was only exceedance

Figure 9. Maximum Daily Wind Speeds, Victorville, March 2003-2007



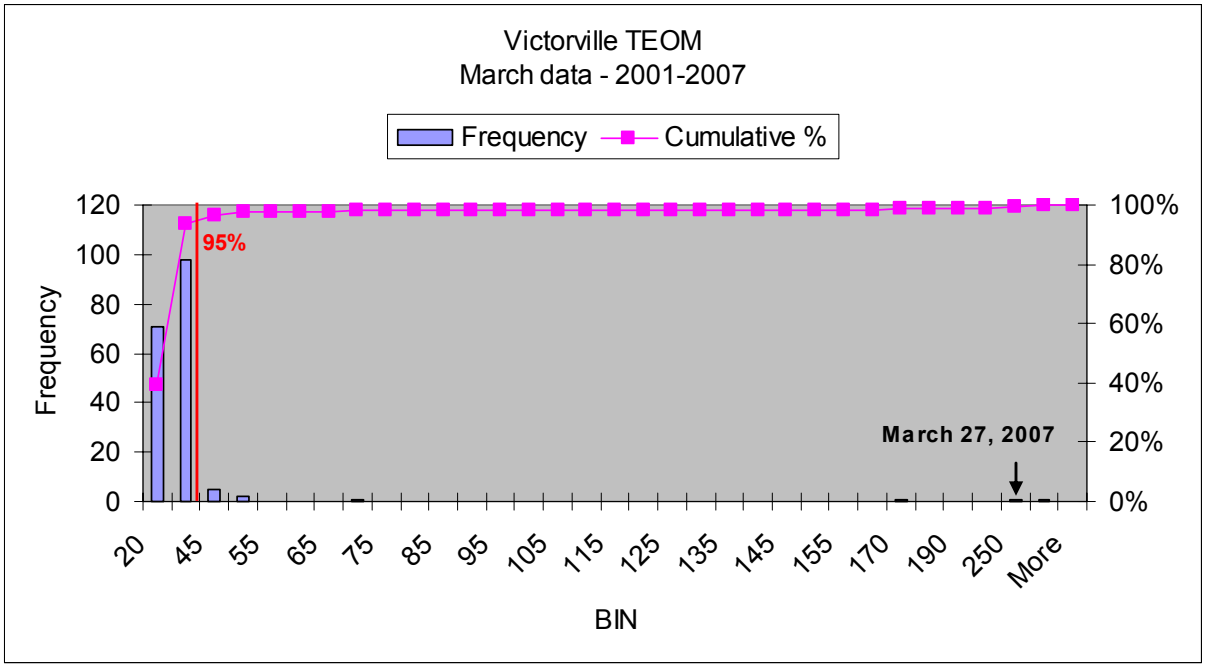
Air Quality

PM concentrations at the Victorville site in March are generally well below the NAAQS (Table 4). As shown in Figure 10, exceedances like the one seen at the TEOM monitoring site on March 27 occur less than 1% of the time. The concentrations were far above historical fluctuations as well as above background levels. Only two other days in March exceeded the NAAQS since 2001. Maximum hourly winds at the Victorville monitoring site on those days, March 26, 2004, and March 13, 2002, were 26 mph and 35 mph, respectively. The nearby Fox Airport recorded wind directions from the west for both events [CARB, AQMIS2, 2009] (directional wind data from the monitoring site was unavailable for these dates).

Table 4. March PM10 Statistics for Victorville

	Victorville FRM (all sites)	***Victorville TEOM (Park site)***
Data Range	1987-2007	2001-2007
Count	91	211
Mean	26.043	25.31
Standard Error	1.17	1.78
Median	25.00	22.29
Mode	21.00	8.96
Standard Deviation	11.18	25.90

Figure 10. Historical March PM10 TEOM Concentrations at Victorville



No exceedance 'but-for' the Event

An estimation of the PM10 mass contributed by the high wind event to the concentration seen at the monitor is given in Table 5. The upper range of a normal concentration for March would have been between 25 and 49 ug/m3. Following U.S. Environmental Protection Agency guidance (U.S.EPA, 2009), ARB Staff estimates that the high wind event on March 27, 2007 provided an additional 190 to 214 ug/m3 of PM10. 'But-For' the high wind speeds, shift in wind direction, and associated hourly PM10 levels, there would have been no exceedance of the federal PM10 standard.

Table 5. Estimate of PM10 Concentration 'But-For' the Event

Event Day Concentration	**March Average (2001-2007)**	**March 98th Percentile**	**Estimated Contribution of Event**
239 ug/m3	25 ug/m3	49 ug/m3	190 - 214 ug/m3

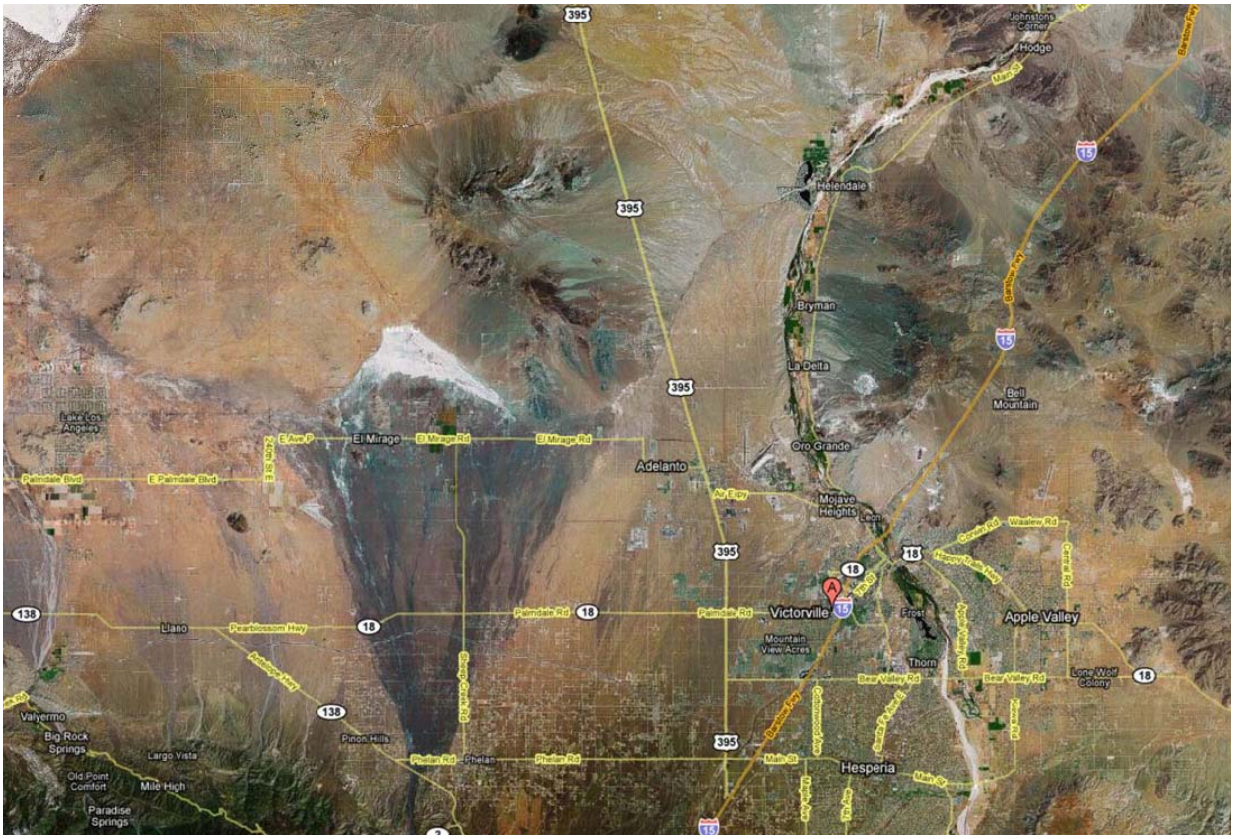
PM Concentrations at the Mojave Desert air quality monitoring sites are generally well below the NAAQS. As noted in the NED, exceedances at the Victorville TEOM like the one on March 27 occurred only seven times from February, 2000 to April 2007 (less than 1% of the time). The March 27 concentration was far above historical fluctuations as well as above background levels.

Determination of Source of PM10 in Area

Victorville is located in the portion of the Mojave Desert known as Victor Valley. The area immediately to the west of Victorville (Figure 11) is mixed desert with some suburban housing and commercial development along Interstate 395. Further west, the area is considered unincorporated land, with a scattering of homes, but still mostly desert. The El Mirage Dry Lake is northwest of Victorville.

The winds that impacted the monitoring site flowed over these western desert areas at speeds high enough to both entrain and transport dust. Dust control measures for the Mojave Desert were in effect on March 26 and 27, but were overwhelmed by these high winds.

Figure 11. Satellite image – Western Mojave Desert (maps.google.com)



The PM10 emissions inventory was reviewed to determine local sources that could generate dust and potentially contribute to the PM10 exceedance. The 2006 PM10 emissions inventory is summarized in Table 6. This inventory portrays annual average emissions and does not directly reflect emissions during an exceptional event.

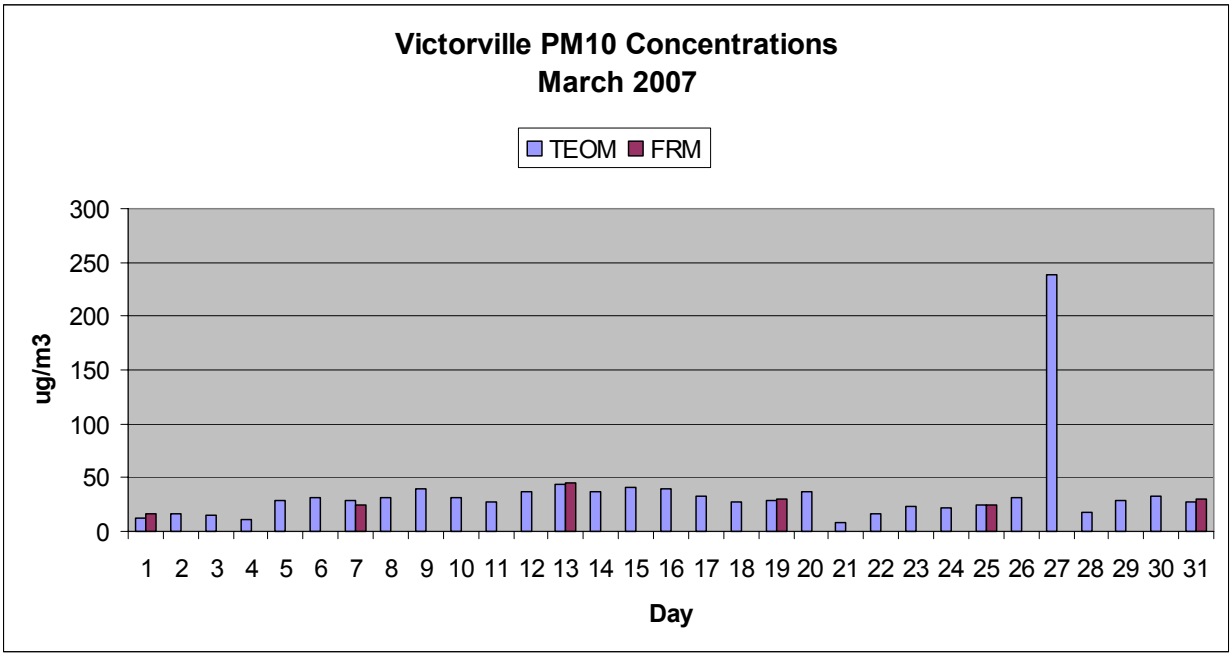
As noted below, the majority of PM10 emissions in the area are from area-wide sources, in particular, road dust (paved and unpaved) and fugitive windblown dust. The MDAQMD adopted Rule 403.2, Fugitive Dust Control for the Mojave Desert, in 1996, as a Reasonably Available Control Measure (RACM). These measures specifically address emissions from construction activities, unpaved roads, and activities on Bureau of Land Management lands. Unfortunately, no measure can control all dust if wind speeds reach a level high enough for entrainment and transport. Hourly averaged scalar wind speeds at Victorville and surrounding areas met or exceeded the entrainment threshold of 15 mph for 10 hours on March 26 and 20 hours on March 27, with gusts at the monitoring site reaching as high as 50 mph (see Figures 2, 5, and 6 in this document, and the NED appendices).

Table 6. 2006 Annual Average PM10 Emission Inventory for San Bernardino County portion of Mojave Desert Air Basin (TPD)

STATIONARY SOURCES	
SUMMARY CATEGORY NAME	**2006**
FUEL COMBUSTION	0.573
WASTE DISPOSAL	0.005
CLEANING AND SURFACE COATINGS	0.019
PETROLEUM PRODUCTION AND MARKETING	0.001
INDUSTRIAL PROCESSES	11.469
**** TOTAL STATIONARY SOURCES**	12.066
AREAWIDE SOURCES	
SUMMARY CATEGORY NAME	**2006**
SOLVENT EVAPORATION	0.000
MISCELLANEOUS PROCESSES	
RESIDENTIAL FUEL COMBUSTION	1.522
FARMING OPERATIONS	0.122
CONSTRUCTION AND DEMOLITION	7.701
PAVED ROAD DUST	9.880
UNPAVED ROAD DUST	34.084
FUGITIVE WINDBLOWN DUST	15.070
FIRES	0.020
MANAGED BURNING AND DISPOSAL	0.453
COOKING	1.795
** TOTAL MISCELLANEOUS PROCESSES**	70.646
**** TOTAL AREAWIDE SOURCES**	70.646
MOBILE SOURCES	
SUMMARY CATEGORY NAME	**2006**
ON-ROAD MOTOR VEHICLES	4.521
OTHER MOBILE SOURCES	1.293
**** TOTAL MOBILE SOURCES**	5.814
TOTAL MOJAVE DESERT AQMD IN SAN BERNARDINO COUNTY	88.526

Additional documentation, submitted by the District to U.S. EPA on March 3, 2008, noted that the event was not related to local anthropogenic or non-compliant emission sources. No changes in emission patterns before, during, or after the event occurred which would account for the increased concentrations. As noted in Figure 12 below, PM10 concentrations at Victorville remained fairly consistent throughout the month and were well below the level of the standard.

Figure 12. PM10 Daily Concentrations – Victorville, March 2007



Mitigation Requirements

Provide for Prompt Public Notification of Exceedance Events

As noted in the NED, a Health Advisory Program exists to notify the public, via website postings and news media releases, of unhealthy air quality events. The District operates four PM10 TEOM sites for forecasting purposes. This data is utilized by the Mojave Desert AQMD website (http://mdaqmd.ca.gov/) to keep the public informed of current conditions. For those without computer access, the District also provides a phone number to call for air quality forecasts. A copy of the health advisory issued for March 27, 2007 is attached to this document.

Provide for Public Education on How to Minimize Exposure

The District has an active community outreach program, as well as easily accessible information on their website to aid in public education on the hazards posed by exceptional events and how to minimize exposure to particulate matter.

Summary

The District request, for the PM10 TEOM concentrations at Victorville on March 27, 2007, to be excluded as due to a natural event caused by dust entrained by high winds, is reasonable and appropriate. The rise in PM10 concentrations at the Victorville site, accompanied as it was by increases in wind speed, a shift in wind direction, and upper-level atmospheric support, indicate a clear and causal connection between the entrained dust and the exceedance at the monitor. Further analysis of historical and

background levels, as well as local emissions, indicates that 'but-for' the high wind, there would not have been an exceedance at the Victorville monitor.

Attachments

Health Advisory issued by District
Newspaper articles regarding high winds in the Mojave Desert

Resources

Bush, David. *T&B Systems Contribution to CRPAQS Initial Data Analysis of Field Program Measurements, Final Report Contract 2002-06PM.* Technical & Business Systems, Inc., November 9, 2004
http://www.arb.ca.gov/airways/CRPAQS/DA/Final/TBFinalOverview.pdf

California Air Resources Board (CARB). *California Surface Wind Climatology*, June 1984

California Air Resources Board (CARB). Air Quality and Meteorological Information System (AQMIS2), http://www.arb.ca.gov/aqmis2/aqinfo.php, 2008, 2009

California Air Resources Board (CARB). Emissions Inventory Data: http://www.arb.ca.gov/ei/emissiondata.htm, 2009

ENVIRON, *Wind Blown Dust Study*, 2004

Federal Register (72 FR 13560-13581). *Treatment of Data Influenced by Exceptional Events; Final Rule*. Vol. 72, No. 55, Pages 13560-13581, March 22, 2007.

Federal Register (73 FR 14687-14713). *Approval and Promulgation of Implementation Plans; Designation of Areas for Air Quality Planning Purposes; State of California; PM-10; Affirmation of Determination of Attainment for the San Joaquin Valley Nonattainment Areas*. Vol. 73, No. 54, Pages 14687-14713, March 19, 2008.

Google Maps. http://maps.google.com. 2008

Mojave Desert Air Quality Management District (District). *Rule 403, Fugitive Dust Control for the Mojave Desert Planning Area*, 1996

Mojave Desert Air Quality Management District (District). *California Environmental Quality Act (CEQA) and Federal Conformity Guidelines*, June 2007

Mojave Desert Air Quality Management District (District). *Natural Event Documentation (NED)*, June 28, 2007; September 28, 2007; and March 3, 2008

Mojave Desert Air Quality Management District (District). Website, http://mdaqmd.ca.gov/, 2008

Mojave Desert Air Quality Management District (District). Website, http://mdaqmd.ca.gov/, 2008

National Oceanic and Atmospheric Administration (NOAA). Air Resources Laboratory, Hybrid Single Particle Lagrangian Integrated Trajectory Model (Hysplit): http://www.arl.noaa.gov/HYSPLIT.php, 2008

San Francisco State University, Department of Geosciences, California Regional Weather Server: http://squall.sfsu.edu/crws/archive/sathts_arch.html, 2008

United States Environmental Protection Agency (U.S. EPA), Neil Frank, Presenting Evidence to Justify Data Exclusion as an Exceptional Event, Presentation to Westar State/EPA Exceptional Events Implementation Meeting, February 25-26, 2009

ATTACHMENTS

1. Health Advisory issued from Mojave Desert AQMD
2. News. Clippings from local newspapers – online archives

Mojave Desert Air Quality Management District
Community Relations & Education Office
14306 Park Avenue
Victorville, CA 92392

NOTICE OF HEALTH ADVISORY ****HAZARDOUS****
PAGE ONE OF ONE
ADVISORY DATE: March 27, 2007
EFFECTIVE DATE: March 27, 2007 TIME: **Until Midnight**
For further information, contact:
Violette Roberts, Community Relations & Education Manager
(760) 245-1661, ext. 6104 or Eldon Heaston, Exective Officer (760) 245-1661, ext. 5538

Due to the current high wind situation, local communities may experience elevated levels of particulate matter in outdoor air. Therefore, the Mojave Desert Air Quality Management District (MDAQMD) recommends that individuals affected take the following precautions throughout the entire **Mojave Desert AQMD** jurisdiction (any areas nearby and surrounding these cities – Adelanto, Apple Valley, Barstow, Hesperia, Lucerene Valley, Needles, Phelan, Trona, Twentynine Palms, and Yucca Valley).

- **EVERYONE** should avoid outdoor exertion. If you must be outdoors please take the following precautions.

- Individuals with respiratory disease, such as asthma, should avoid moderate or heavy exertion. Everyone else, especially children and the elderly should avoid prolonged exertion.

- Stay indoors if possible. Keep doors and windows closed when possible and set air conditioners on the "recycled air" setting, if units are equipped with this option (i.e., close the outdoor air vent)

- Office building managers are advised to set ventilation/air conditioning systems to minimize outdoor air entering structures (remember to re-set system once the episode is over).

- Outdoor workers are advised to minimize prolonged outdoor exertion.

- Individuals experiencing breathing difficulties or chest pain are advised to see their physician.

For updated information, call the MDAQMD's automated Air Quality Forecast Line at (760) 245-1661, ext. 5067 or the Community Relations & Education Office at (760) 245-1661, ext. 6717. Or visit our website at www.mdaqmd.ca.gov for more health precautions and the latest air quality information updates as made available.

Bizarre weather

FROM STAFF AND WIRE REPORTS
March 28, 2007 - 7:03AM

Volatile weather swept through Southern California on Tuesday, bringing downpours, hail, snow and fierce winds that capsized boats and downed power lines and trees, cutting power to more than 144,000.

Winds gusting to 50 mph in the Victor Valley produced dangerous driving conditions and a power outage.

Sheriff's deputies responded Tuesday afternoon to a vehicle crash at Mojave Drive and El Evado Road around 3:30 p.m., and within 10 minutes there were two more accidents at Mojave Drive and Amethyst Road.

"That whole north side of Mojave is dirt. During any wind storm the visibility is greatly reduced. It was down to about three to five feet of visibility," said Deputy Marc Bracco of the San Bernardino County Sheriff's Department Victorville station.

Deputy Pete Gryp returned to the station from handling the accidents, covered head to toe in dirt and sand.

"It's a complete blackout on Mojave," Gryp said at about 4:30 p.m.

Up to 1,500 Apple Valley customers were without power Tuesday around Navajo and Thunderbird roads, said Nancy Jackson of Southern California Edison. Crews have restored power to some affected customers.

Tuesday morning, 800 customers in Lucerne Valley were without power due to the storm.

Hail and downed trees have also been reported in the High Desert, and a thin layer of snow greeted Wrightwood residents Tuesday morning.

The National Weather Service said high winds may continue in the High Desert until about 3 a.m. today, with gusts as high as 75 mph.

Drivers are urged to take caution, especially if operating high-profile vehicles.

Elsewhere, the roof was torn off the Orange County Fire Authority's aviation building in Fullerton and harbor patrol officers made numerous rescues involving capsized craft in Newport Bay and offshore.

A large section of roof laminate and asphalt tile landed on four cars and caused minor damages, but no injuries, said fire Capt. Stephen J. Miller.

He said fire crews were also responding to "tons" of reports of downed trees and power lines.

"It was pretty crazy out there. I was driving on the freeway and saw many dust storms," Miller said.

Winds gusting up to 40 mph caused a small powerboat and three outriggers to capsize, said Orange County sheriff's Sgt. David Ginther.

He said members of the Newport Beach Harbor Patrol rescued a man whose 11-foot boat capsized about a mile off Laguna Beach after the sailor used a cell phone to call 911.

In Newport Bay, 24 members of a University of California, Irvine rowing crew were thrown into the water when their boats flipped. Some students swam ashore while others were rescued from the frigid water, Ginther said.

Thick snow flurries fell in Twentynine Palms, KCDZ-Joshua Tree reported.

The day dawned clear and breezy across Southern California, but fast-moving clouds blotted out the sun at times as downpours pelted parts of greater Los Angeles, then just as rapidly gave way to blue skies.

"The front moved through Los Angeles before sunrise, and as the day progressed, heating generated unstable air and helped cause the gusty winds," said meteorologist Eric Boldt of the National Weather Service.

About 123,800 Southern California Edison customers had outages during the day, but only about 8,200 remained blacked out late afternoon, the utility said.

Another 20,000 Los Angeles Department of Water and Power customers throughout the city also lost power, said spokeswoman Kim Hughes.

Scorpions slip past Sultans

By TIM HARAN Staff Writer
March 28, 2007 - 6:56AM

HESPERIA - Robert Moon knows his role as a reliever, and on Tuesday his closing abilities helped the Hesperia baseball team slip past crosstown rival Sultana.

"That's the job he's got this year," Hesperia coach Chris Salas said. "He's the guy that's going to come in and shut teams down when we need him to. He's got that bulldog mentality."

Moon pitched two hitless innings, and Trevin Cano's two-run homer highlighted a six-run fifth as Hesperia rallied for a 9-8 Mojave River League victory over Sultana.

"No matter how far we're down or what inning it is, this team will try to come back," said Cano, the Hesperia senior catcher who went 2-for-3. "It seems like one person gets a hit, we all cycle around and get hit after hit."

Six straight Scorpions reached base in the crucial fifth inning as Hesperia (7-3, 3-0 MRL) rallied to win its fourth consecutive game and avenge a loss earlier in the year to Sultana (9-3, 1-1) in the Upland Tournament championship.

"It seems to be a back-andforth battle every time (against Sultana)," Salas said. "Pitching held out for us at the end."

Sultana tallied three hits to open the sixth and put the potential tying run in scoring position before the Scorpions handed the ball to Moon.

"I love to be in that spot," said Moon, who surrendered a sacrifice fly before retiring five of the final six batters. "The team really came together today with timely hitting."

Sultana starter Daniel Williamson sent down the first six batters he faced before running into trouble in the third. Hesperia scored three times, punctuated by Matt Serret's two-run single, to erase a two-run deficit and take a 3-2 lead.

But the Sultans, who are ranked No. 4 in the latest CIFSouthern Section Division V poll, bounced back. Thomas Southern blasted a three-run homer to left, which chased Hesperia starter Bobby Hutter. It marked the first of three home runs hit on the afternoon, as a relentless wind blew out to left.

Hutter struck out seven batters, including the side in the third inning, and Hesperia pitchers combined to record 12 strikeouts on the day.

"Kids sometimes think they know the strike zone better than the umpires," Sultana coach Dave Hill said. "We got close. I appreciate the effort."

Williamson, who hit a fifthinning solo home run to put the Sultans in front 6-3, moved to third base in the bottom of the inning and watched as Hesperia went to work on the Sultana bullpen.

"On the mound it was fine, but my defense, a couple bad plays cost us the game," said Williamson, who committed two errors, including a key miscue ahead of Hutter's two-run double in the sixth.

Strong winds, which reportedly gusted up to 50 mph, wreaked havoc with fly balls, forced fielders to chase after their caps and left players rinsing Hesperia High's infield dirt from their eyes.

"We knew it was going to be ugly," Hill said. "The good thing was the conditions didn't determine the outcome. It was their hitting and their pitching that decided it."

The Scorpions scored six fifthinning runs against a pair of Sultana relievers and withstood the Sultans' rally in the sixth, which whittled Hesperia's lead to a run before Moon - and a nifty game-ending play at third by Hutter - closed the door to keep the Scorpions perfect in the MRL.

"(Sultana) hit the ball well and I know that in order to beat them we have to score," Salas said. "We didn't hang our heads after they got the lead."